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ABSTRACT

Outside the core grammar, the set of "peripheral" or marked properties of a language include exceptions or relaxations of the settings of core grammar and the idiosyncratic features of the language governed by particular lexical items. The core/peripheral distinction has direct implications for grammatical development in children. The effects of the core/periphery distinction in actual language acquisition are explored, and it is suggested that this theoretical distinction explains a number of properties of real-time acquisition. It is demonstrated that core and peripheral aspects of grammar are acquired differently and that the latter poses a more substantial learning problem for the child. The evidence considered comes from the acquisition of inflectional morphology. Acquisition of verbal inflection is discussed, proposing that the variability in the grammatical status of inflection across languages accounts for its relative ease or difficulty of acquisition. The second section addresses markedness and acquisition, drawing on evidence from agrammatic aphasics that supports the analysis of inflection proposed earlier. (MSE)

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The Core/Periphery Distinction in Language Acquisition

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THE CORE/PERIPHERY DISTINCTION IN LANGUAGE ACQUISITION*

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0. Introduction

The core grammar of a particular language is the set of grammatical properties which are determined by fixing the parameters of Universal Grammar (UG) in one or another of the permitted configurations. Outside of core grammar is the set of "peripheral" or "marked" properties of the language. The periphery includes, among other things, exceptions or "relaxations" of the settings of core grammar and the idiosyncratic features of the language which are governed by particular lexical items.[1]

The core/periphery distinction has rather direct implications for grammatical development in children. We expect that those aspects of a particular grammatical phenomenon which are marked or peripheral will be more "difficult" to acquire than those features of the construction which are derived from core grammar. This difficulty should manifest itself in at least two ways. First, the peripheral aspects of a construction should be acquired later than the core properties associated with that construction.[2] Second, peripheral aspects of grammar may be acquired in a more piecemeal, i.e., less systematic manner. The difficulty associated with learning the periphery is perhaps due to the fact that it must be learned on the basis of data which are more "exotic" or less accessible in the input. Or, it may be that learning the periphery involves more computation or a different sort of computation than the setting of parameters in core grammar.

In this paper I will explore the effects of the core/periphery distinction in actual language acquisition. I will suggest that this theoretical distinction explains a number of properties of real-time acquisition. In particular, I hope to show that core and peripheral aspects of grammar are acquired differently and that the latter pose a more substantial learning problem for the child. The evidence I will consider comes from the acquisition of inflectional morphology.

The theory of core/peripheral grammar is a particularly fruitful area in which to explore the relationship between linguistic theory and language development. One of the traditional concerns of language

acquisition studies has been to determine what constitutes formal complexity for the child since it is assumed that at least one important factor affecting order of acquisition is the relative complexity of different grammatical rules and constructions. The core/periphery distinction thus provides a measure of linguistic complexity against which the acquisition data may be viewed. At the same time the acquisition data, and in fact other forms of psycholinguistic evidence such as data from processing and language deficits, can inform the theory of grammar. One expects that evidence from these areas, used alongside grammar-internal and comparative evidence, will contribute towards determining which aspects of grammar are more or less marked or peripheral. Thus, a second goal of this paper is to show that the acquisition data, coupled with certain reasonable assumptions about the learning process, can indeed provide insight into the structure of Universal Grammar (UG) and the theory of markedness.

In Section 1 I discuss the acquisition of verbal inflection. On the basis of cross-linguistic acquisition evidence I argue that the grammatical status of inflectional systems may vary across languages. In certain cases it is closely related to core grammar; in other cases it is a peripheral property of the language. The variable status of inflection accounts for its relative ease or difficulty of acquisition in different languages. In Section 2 there is a general discussion of markedness and acquisition. Included in this section is a presentation of some cross-linguistic evidence from agrammatic aphasics which further supports the analysis of inflection proposed in Section 1.

1. The Acquisition of Inflection

The first question I would like to address is 'why is an impoverished morphological system like that of English so difficult to acquire?' It is well-known that English speaking children achieve productive control of verbal inflection relatively late in the acquisition process. Brown (1973), in his study of the 14 grammatical morphemes, ranks the the '3rd person regular' (-s) as 9.66 in order of acquisition. The mean age of the three children studied by Brown at the point at which they had productive control of this verbal inflection is 2;9. Similarly, Brown ranks acquisition of the regular past tense -ed morpheme as 9.00, only slightly earlier. This latter observation suggests that the child's difficulty with the 3rd person regular morpheme is not a function of whatever grammatical complexity is

inherent in agreement rules since the English past tense morpheme does not agree with the subject in any sense, though it is also a late acquisition. Rather, it seems that the English speaking child has difficulty with verbal inflection in general. As noted by Brown and others, the absence of inflectional affixes is one of the salient properties of early language which contributes to its "telegraphic" quality. There is one apparent exception to this generalization, the present progressive morpheme -ing, which Brown ranks as the first of the 14 morphemes to be acquired. I will return to this later.

This late mastery of English inflection is particularly surprising in light of recent research which shows that children acquiring much more richly inflected languages learn the inflectional system of these languages at a strikingly early age and with relatively few errors. Consider, for example, the child acquiring Polish. Weist & Witkowska-Stadnik (1985) report that the children they studied had productive control of the nominal case system (which contains 7 cases), and subject-verb agreement for person, number and gender by age 1;9. Similarly, in my own study of the acquisition of agreement rules by Italian speaking children (Hyams, 1984), I found that they had mastered the present tense verbal paradigm by roughly age 2;0.

In Italian the verb is inflected to agree with the subject in person and number. One of the present tense paradigm is given in (1).

(1) parl- (to speak)

	singular	plural
1p	-o	-iamo
2p	-i	-ate
3p	-a	-anno

If we compare the matrix in (1) with that in (2), the present tense paradigm for English, it seems clear that the English speaking child's problem does not lie in the learning of particular affixes. Common sense (and any learning theory) tells us that it should be more difficult to learn the six Italian affixes than the single English one.

(2) speak

	singular	plural
1p	0	0
2p	0	0
3p	-s	0

What then accounts for the relative difficulty which English children exhibit in learning the inflectional system of their language? In the section that follows I will offer an answer to this question.

1.1 The Stem Parameter

The above facts lead to the conclusion that the rate at which a child learns the inflectional system of his language is not a function of the intuitive complexity of the system. Instead, what I would like to suggest is that the relative ease of acquisition depends in large measure on how the system interacts with principles of UG, or more to the point, whether the inflectional system is a core or peripheral property of the language being acquired.

Before turning to the acquisition facts, however, let us consider the structure of the systems to be acquired. Notice that there is an obvious difference between English on the one hand, and languages like Italian on the other. In English, a verbal stem may surface without an overt affix. Thus, speak is a well-formed word in the language. In Italian, in contrast, the verbal stem requires an overt affix; the form parl- is simply ill-formed. We can express the different morphological requirements of the two languages as a parameter, informally stated as in (3).

(3) The Stem Parameter

A verbal stem does/does not constitute a well-formed word.

Since languages may vary in the manner suggested in (3), this parameter must be fixed by the child at the value which is appropriate for the particular language he is exposed to.

Let us turn now to the acquisition facts noted earlier. Young English speaking children typically produce uninflected verb forms, as illustrated in (4) (from Bloom, Lightbown & Hood, 1975).

(4) Mommy throw it away
Man sit down
Kathryn want build another house
Gia ride bike

These sentences violate a syntactic rule of agreement, which requires that the verb agree with a 3rd person singular subject. However, given the parameter in (3), these productions are well-formed at the morphological level since in English a verbal stem constitutes a well-formed word. In Italian-like languages, in contrast, the verb must surface with an overt affix. Children acquiring Italian and similar languages, rarely, if ever, produce uninflected verbs. Thus, like English-speaking children, their verbs are well-formed at the appropriate grammatical level. These facts suggest that language particular conditions on word structure are learned at a very early age, or given the analysis proposed here, that the parameter in (3) is set very early on.

With regard to the learning of particular affixes, it seems reasonable to suppose that their rate of acquisition will depend in part on the choice which the child makes with respect to the Stem Parameter. Once the Italian-speaking child determines that stems require overt affixes in his language, he will need to learn the affixes in order to satisfy this requirement. So the learning of particular affixes is triggered by the parameter setting.[3] The English speaking child sets the Stem Parameter at the opposite value; a verbal stem constitutes a well-formed word. Thus, he need not learn any inflectional morphemes in order to satisfy the well-formedness condition in his language. Obviously, each child will set this parameter based on the linguistic input he receives.[4] The English speaking child hears that the verb is largely invariant in form, while the Italian child receives a much richer and more varied input.[5]

One desirable result of this account is that there is no sense in which the English speaking child is grammatically "delayed" relative to his Italian or Polish speaking cohorts. The difference in linguistic behavior exhibited by the two populations is strictly an effect of different settings along a particular parameter. In each case the child's language conforms to the specifications of the particular grammar he has developed. Moreover, the learning of particular affixes is no more or less difficult for the English speaking children than for the Italian child. Rather, the English speaking child does not learn inflectional morphemes at this stage because this acquisition has not been

triggered by his parameter setting. On his analysis English is a language with no verbal morphology.

Assuming that this account is on the right track, what explains the precocious appearance of the progressive -ing morpheme, which, as noted earlier, is the first of Brown's 14 grammatical morphemes to be acquired. Moreover, what do we say about the eventual acquisition of 3rd person regular and past tense morphemes? How are they acquired—and why? These questions will be addressed in the section that follows.

1.2 Learning the Periphery

I turn first to the progressive morpheme, illustrated in the sentences in (5) (from Bellugi, 1967).

(5) No the sun shining
He eating ice cream
You waking me up
Oh, no raining

Although sentences of this sort are frequent in early language during a time when children are not using the present or past tense affixes, there is some reason to suspect that the child does not initially analyze the progressive form of the verb as consisting of a verbal stem and affix.

First, as exemplified by the examples in (5), the progressive verb is first used without the auxiliary be, suggesting that -ing is not a separate morpheme which is selected by the auxiliary, as is the case in the adult grammar. Instead, it may be that the child learns each progressive form as a distinct verb so that hit and hitting, for example, actual represent two distinct lexical entries. This hypothesis is supported by a second fact, noted by Cazden (1968), that unlike the verbal affixes -s and -ed , -ing fails to overgeneralize. Thus, while errors such as those in (6) are common, forms such as those in (7) are virtually unattested in the acquisition data.[6] (The # sign is used to indicate that the forms are unattested.)

(6) taked
tooks
gots
maked

(7) #tooking
#wenting

If we credit the child with actually knowing the progressive morpheme only at the point at which it co-occurs with the auxiliary be, then its acquisition occurs significantly later. According to Brown (1973) the auxiliary be is the last of the 14 grammatical morphemes to be acquired.

Let me now turn to the question of how the child eventually acquires the verbal inflections of English. Here the core/periphery distinction becomes relevant. Recall that core properties of grammar are those which are determined by fixing the parameters of UG, while marked or peripheral processes often involve exceptions or a relaxation of particular parameter settings. We saw that the acquisition of the Italian affixes is triggered by a particular setting along the Stem Parameter, one which requires that verbal stems bear affixes. On this account, then, inflectional morphology in a language like Italian represents a core property of the language insofar as it is closely related to (i.e. triggered by) the setting of a particular parameter. Consider, on the other hand, the English case. In English the setting along the Stem Parameter specifies that verbs are uninflected. Such inflections as there are thus represent a "departure" from the core grammar of English. Assuming, as we have been, that the peripheral aspects of a grammatical subsystem take longer to sort out than the core properties (requiring either more exposure to data or more computation), it is clear why the relatively weak inflectional system of English i.e., the 3rd person, past tense, and progressive morphemes, are acquired later that the inflectional paradigms in more richly inflected languages.

The hypothesis is then that inflectional systems (and perhaps other properties of grammar as well) have a variable status across languages; in English inflection is a peripheral property of the language, while in Italian, for example, it is a core property. Naturally, we would expect this difference in the two language types to have effects which extend beyond acquisition. This is indeed the case and some of these effects will be discussed in Section 2. With respect to acquisition, however, the crucial point is that on this account it is the markedness of rule systems, that is, the degree of deviation from the core grammar, rather than the intuitive complexity of the data which is responsible for the relative ease or difficulty of acquisition.

1.3 The overgeneralization of affixation

The analysis which I am proposing allows us to explain another curious acquisition phenomenon, namely, why children acquiring languages with relatively rich inflectional systems tend to avoid 0 affixation, even where the latter would be correct in the adult language. Slobin (1973) observes that children acquiring Russian mark all accusative nouns with the feminine accusative -ɯ affix although in the adult language, masculine non-human and neuter accusative nouns bear a 0 affix. Similarly, he reports that Gvozdev's (1961) Russian child used the affix -ov for all plural genitive nouns, replacing the feminine plural genitive 0 affix. He further notes that the replacement of 0 affixes also occurs in the acquisition of Serbo-Croatian. Slobin expresses the generalization as in (8).

(8) There is a preference not to mark a semantic category by 0 (zero morpheme). If a category is sometimes marked by 0 and sometimes by an overt phonological form, the latter will, at some stage, also replace the 0. (Slobin, 1973; p. 202)

The Stem Parameter formulated in (3) (modified slightly to include nouns as well as verbs) provides a straightforward explanation for this phenomenon. Russian, and the other languages noted by Slobin, are richly inflected languages which typically do not allow bare stems; the obvious exceptions being the cases of 0 affixation like those discussed above. Thus, we may assume that Russian adopts the [–bare stem] option along the Stem Parameter. Having determined that bare stems are ill-formed in his language, the Russian-speaking child replaces all zero morphemes with overt affixes. Those instances in which the noun is indeed uninflected represent a marked extension of the Russian system, a relaxation of the Stem Parameter; they are therefore a later acquisition.

A similar situation exists in German. Adult German has a richly inflected verbal system, which does, however, exhibit instances of 0 affixation. The imperative form of the verb bears no overt affix and the 1st and 3rd person singular past tense form of the so-called 'strong verbs' is uninflected, though it does undergo a vowel alternation, as illustrated below.

(9) kommen 'to come'

kommɐ	1st per. pres.
kam	1st per. past
komm	imperative

Clahsen (1986 and personal communication) notes that German children pass through a developmental stage (his Phase III), which lasts up to about age 3;0, in which they overgeneralize affixation to forms which would be uninflected in the adult language. This is done predominantly by using the 1st person singular -ɐ affix with 'strong' or irregular verbs, as in (10), and also by a strategy which Clahsen refers to as 'pronominal copying.' In the latter case the child attaches a copy of the subject pronoun to the verb, as in (11). The examples below are from Clahsen (p.c.).

(10) ich kannɐ drinsitzin
'I can in -sit' (=I can sit in there)

(11) ich kannich
'I can -I'

By age 3;0 (Clahsen's Phase IV) the overgeneralizations and pronominal copies cease and the children establish the correct verbal paradigms.

As Clahsen (personal communication) points out, the German child's behavior during this stage is easily explained by the parameterized account of the acquisition of inflection proposed in this paper. As occurs in the acquisition of Russian and Serbo-Croatian discussed above, the German speaking child, confronted with a rich system of verbal inflection, sets the Stem Parameter at the [–bare stem] option. He "avoids" 0 affixation since such forms are ungrammatical in his grammar. As in the previous case, he later learns the zero forms as a marked extension of the system.[7]

Closely related to the 'avoid 0 affixation generalization' is a phenomenon which Slobin (1973) refers to as "inflectional imperialism." This acquisition phenomenon as well can be partially explained by the analysis proposed in this paper.

Slobin notes that in acquiring a set of affixes for a particular grammatical class children will very often first learn only one member of the set and overgeneralize it to all words in the class. A typically

example is the child who is acquiring a language with a case system who first learns the feminine form of the nominative and uses it with masculine and neuter nouns as well as feminine ones. A concrete example is offered by Levy (1980), who observes that the Hebrew speaking child first marks plurality on nouns by the invariant addition of the masculine suffix -im, and only later distinguishes the feminine nouns by the affix -ot.

Although it is unclear why the child chooses a particular affix to begin with, for example, why the Hebrew-speaking child first chooses the -im affix, the account proposed here does provide an explanation for why the first affix acquired is overgeneralized. The alternative would be to leave the other forms (for which the appropriate affixes have not yet been learned) without any affix whatsoever. This latter option, however, is excluded by the requirement that the stem bear some affix. Thus, 'inflectional imperialism' is a kind of stop-gap measure which allows the child to satisfy the grammatical requirements imposed by the Stem Parameter during the period in which he is learning the full range of affixes.

1.4 Modularity in the acquisition of inflection

Before concluding Section 1, it is worth noting that the overgeneralization of affixation, whether in the form of avoiding 0 forms or "inflectional imperialism," does not really correspond to what we would intuitively think to be the simplest or most efficient learning procedure for acquiring an inflectional system. A priori, it would seem that the simplest way to accomplish this task would be to learn each affix and its context and leave uninflected those forms for which the appropriate affixes have not yet been mastered, an option suggested above. The Hebrew speaking child who learned by this deterministic method, for example, would first mark masculine nouns with -im and leave the feminine forms uninflected; inflected feminine forms would come later with the acquisition of -ot. Certainly, if we were to program a computer to acquire an inflectional system, this would be the way to go. Thus, the question that arises here is why isn't the child an efficient, albeit conservative, learner in this domain?

In order to answer this question satisfactorily we need to tease apart two tasks which face the child. One is the learning of particular affixes and their surface distribution. Let us refer to this simply as "affix-learning." The second task facing the child involves real

grammatical development; he must determine the function of the inflectional system within the grammar as a whole, in our terms, whether it is a core or peripheral property of the language. Most accounts of the acquisition of inflection are concerned exclusively with the problem of affix-learning. The analysis proposed in this paper, in contrast, is directed at the issue of grammatical development. This is not to deny that affix-learning represents a formidable learning task for the child, comparable in many respects to word-learning. It seems, however, that many of the most interesting phenomena associated with the acquisition of morphology, for example, the variable rate of acquisition across languages, overgeneralization (as in Russian), and undergeneralization (as in English) are more readily explained as effects of grammatical development, in particular of parameter setting, rather than of affix-learning. The suggestion that the learning of inflection involves development in separate domains is obviously very much in the spirit of the modularity hypothesis, which holds that particular grammatical constructions arise through the interaction of principles in distinct subcomponents of the grammar (Chomsky, 1981).

In the section that follows I would like to briefly discuss the acquisition of inflection in American Sign Language (ASL). As we will see, ASL falls somewhere between the Italian-type languages with their rich inflectional system, and English-like languages with an impoverished morphology and thus represents an interesting case.

1.5 American Sign Language

ASL is a language which exhibits subject-verb agreement. The agreement is marked by the movement of the verb in relation to specific points in space. A priori, it would be reasonable to expect the acquisition of the agreement system to pattern like that of other inflected languages, for example, Italian. As it turns out, however, signing children acquire subject-verb agreement quite late. Lillo-Martin (1986) reports that with non-present referents, that is, instances in which the subject of the sentence is not physically present and is designated by a point in signing space, the children did not achieve productive control of agreement until 5-6 years. Agreement with present referents, though an earlier acquisition, is still late as compared with Italian and Polish speaking children. According to Meier (1982), agreement with present referents is typically achieved

around 2 1/2 or 3 years. Thus, signing children appear to pattern like English speaking children, as against Italian or Polish speaking children—a rather surprising result on the face of it.[8]

This result is somewhat less surprising, however, when we consider the nature of the input data in ASL. Although ASL has a much richer system of verbal morphology than English, since all grammatical persons are marked, this is true only for a subset of the verbs in the language. There is an entire class of verbs in ASL which do not inflect to agree with the subject, the so-called 'plain verbs.' Moreover, the inflection on the 'inflecting verbs' is optional. (As we will see shortly, this optionality is an important factor determining the setting of the Stem Parameter in ASL.) Thus, the input data in ASL are extremely variable as regards the presence of inflection. This is a very different situation than exists in Italian or Polish, for example, where the input data are quite consistent in this respect.

However, the fact that the data are variable still does not explain why the signing child chooses the [+bare stem] option. Given such variable input, the child could easily choose either value of the Stem Parameter. Thus, unlike the previous cases we have considered the input data do not determine the parameter setting in any straightforward way. Other factors appear to be at play here.

The reason for the [+bare stem] setting in ASL becomes obvious once we consider the nature of the learning task that the child is faced with. On the well-motivated assumption that the child learns from positive evidence alone (Baker, 1979), the only way the signing child could learn the inflectional system of the language is to assume a [+bare stem] setting. If the child starts out under the assumption that there is no inflection in the language, s/he can learn from positive evidence alone—tokens of inflected verbs in the input—that some verbs can bear inflection. If, on the other hand, the child were to assume that all verbs are inflected, the [–bare stem] option, s/he could not tell, based on positive evidence alone, whether a particular uninflected form is a 'plain' verb (which should never be inflected) or simply an uninflected token of an inflecting verb (which can be inflected optionally). Thus the signing child initially assumes that bare verbal stems are well-formed words and sets the Stem Parameter accordingly.[9] If this is the case, verbal inflection is late in ASL because, as in English, it is acquired as a peripheral property of the language. The child needs to learn, more or less on a verb-by-verb basis, which ones are inflectable.

2. Markedness Theory

The primary aim of this paper has been to show that the core/periphery distinction has rather direct empirical consequences for actual grammatical development. We saw that in languages in which inflection represents a core property of the language, it is acquired early, while it is a very late acquisition in those languages with peripheral morphology. In addition, various error patterns, including the overgeneralization and undergeneralization of inflection, can be explained as effects of the core/peripheral status of the inflectional system in a particular language.

A central point of the analysis of inflection was that the status of verbal morphology varies from language to language. This view of syntactic markedness, in which a particular phenomenon may be marked or peripheral in one language, but part of the core grammar of the next language is somewhat unusual and perhaps not uncontroversial. Thus in the last part of this paper I would like to provide some additional support for this claim, particularly as it applies to the analysis of inflection in the previous section. I will consider some psycholinguistic evidence, production data from aphasic speakers. We will see that the cross-linguistic variation which one finds in the aphasic's use of inflection follows from the markedness claims being proposed.

2.1 Language Dissolution

The claim that the formal grammatical status of inflectional systems varies from language to language receives some further support from cross-linguistic studies of agrammatic aphasics, in particular the work of Y. Grodzinsky (1984). Agrammatic patients, a subclass of Broca's aphasics, are typically characterized as having "telegraphic" speech. Like young children, their speech is marked by an absence of grammatical formatives, including inflections. Interestingly, Grodzinsky notes that of the languages he studied, the omission of inflectional morphology only occurs with English speaking aphasics. Speakers of Italian, Russian and Hebrew, in contrast, never drop inflectional affixes—though the affixes frequently fail to agree appropriately. Thus, while the Italian aphasic might utter sentences of the sort given in (12a,b), where the verb bears some inflection which fails to appropriately agree with the subject, he will

never make the error of producing a bare verbal stem, (as in (12c)), as the English speaking agrammatic typically does.

(12) a. Ragazza parlo.
(girl speak -1st person singular affix)
b. Ragazza parlare.
(girl speak-infinitive affix)
c. *Ragazza parl
(Girl speak -stem)[10]

This difference between aphasic speakers of English on the one hand, and speakers of languages like Italian, Russian, and Hebrew, on the other, is exactly what we would expect under the assumption that marked or peripheral grammatical processes are somehow more vulnerable or easily disrupted in the event of neurological damage, as originally proposed by Jakobson (1968). The inflectional requirements of the other languages, however, which are more closely connected to core grammar, appear to be more stable.

To conclude the discussion of agrammatism let me say a word about ASL. The analysis presented earlier, in which inflection in ASL is peripheral, leads us to expect that ASL agrammatic aphasics will pattern like English speaking aphasics in omitting verbal inflection. I know of only one relevant case, discussed in Bellugi et al. (1983), and this aphasic patient did indeed drop the agreement morphology, as predicted.

In this section I have argued that the Stem Parameter and the core/periphery analysis of inflection presented in Section 1 is motivated not only by the acquisition data, but is also supported by cross-linguistic studies of language dissolution.[11]

2.2 Conclusion

Let me conclude by saying that the analysis of inflection proposed here obviously needs to be tested against the acquisition data of other languages—especially since morphological systems vary a fair amount from language to language.[12] However, irrespective of the ultimate correctness of the specific analysis I have proposed, I hope to have made several more general theoretical and methodological points: first, that it is not necessarily the intuitive complexity of the data which makes the acquisition of a particular

construction or grammatical phenomenon difficult, but rather the complexity of rule systems, where we understand "complexity" to mean degree of deviation from core grammar; second, that sometimes what appears to be acquisition of a single aspect of grammar, e.g. verbal inflection, often involves development in several different domains which interact in very subtle ways; third, that data from language acquisition (and other theory-external areas) can provide insight into the structure of UG and particular grammars; and finally that the core/periphery distinction as a theory of markedness can go quite a long way in explaining a number of properties of real-time grammatical development.

FOOTNOTES

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[1] Here and throughout this paper, I use the terms "marked" and "peripheral" interchangeably. This may not in fact be exact. It would seem that idiosyncratic lexical properties are peripheral, though they need not be marked. For the purposes of this paper, however, I will continue to ignore this distinction. The acquisition predictions are unaffected by this sloppiness since peripheral properties, marked or not, are expected to be late as compared to core properties.

[2] It is important to emphasize that I am not suggesting that all of core grammar must emerge before any peripheral properties are realized. Rather, the claim is that with respect to a particular grammatical phenomenon the core properties associated with that phenomenon will emerge prior to the peripheral ones. This point should become clear as the paper proceeds.

[3] Slobin (1973) and others have proposed that the ease with which a child acquires a particular inflectional paradigm is dependent on a

number of different factors, including semantic transparency, perceptual salience, and morphological regularity. While each of these factors certainly influences the rate of acquisition of particular affixes, the hypothesis being advanced in this paper is that the primary determinant of morphological development is the centrality of inflection in the particular grammar being acquired.

Although Slobin's proposals and the one being suggested here are not necessarily incompatible, there are a number of instances in which they do make different empirical predictions. For example, according to Slobin, a paradigm which is regular, semantically transparent and perceptually salient should be a relatively easy paradigm to learn. On my analysis, these factors would be largely irrelevant if inflection is not a core property of the particular language being acquired.

[4] As we will see in the discussion of the acquisition of ASL in section 1.5, when the input data are very mixed; some forms requiring affixes and others not, the child sets the Stem Parameter at the [+bare stem] option. I will refer to this as the "default" value, as distinct from the "unmarked" value.

[5] Clancy (1987; personal communication) notes that Japanese speaking children behave very much like Italian and Polish children with regard to the phenomenon under discussion. In particular, she notes that "a striking feature of the acquisition of Japanese is the precocious control of verbal inflection" (1987; p. 425).

Following Slobin (1973), Clancy suggests a number of factors which may account for the early acquisition of verbal inflection in Japanese. She notes that verbal inflections are (1) perceptually salient (occurring in utterance-final position), (2) morphologically regular, (3) usually semantically distinct, and (4) very frequent in the adult input to children. The reason for the frequency, Clancy observes, is that "there is no base form of the Japanese verb so that every verb which a child hears is necessarily inflected for some tense/aspect" (p. 427).

Although factors such as perceptual salience, morphological regularity, and semantic distinctness contribute to the ease with which children learn particular affixes (cf. note 3), I would argue that these factors have a different status than the fourth one which Clancy cites. On the analysis which I am proposing the fact that the Japanese child, like the Italian child, does not hear an invariant verb form leads him to

set the Stem Parameter such that bare stems are impossible and it is this setting of the parameter which triggers the early learning of affixes. The distinction which I am making here (see also note 3) between the acquisition of particular affixes and acquiring the knowledge that affixation is a grammatical requirement of a language will be discussed in more detail in section 1.4.

[6] It is also the case, as noted in Brown (1973), that children do not overgeneralize -ing to stative verbs. This fact has led many researchers to assume that very young children understand the stative/process distinction and the semantic restriction on -ing. While it is possible that children do know the process/stative distinction very early on (see Cziko (1986) for impressive cross-linguistic evidence to this effect.), it does not follow that they analyze the progressive verb form as bimorphemic. An alternative explanation, and one which would account for the absence of overgeneralization, is that the child initially learns each progressive form as a separate unanalyzed verb and hence uses only those forms that he has heard in the input language, that is, non-stative verbs.

[7] Although the Stem Parameter analysis provides an account of the Phase III acquisition data, it does not easily handle the facts of Phase II (to age 2;0). Clahsen notes that during the earlier stage German speaking children use predominantly the 0 affix (discussed in the text) *and* the -n affix (which marks 1st and 3rd person plural in the adult grammar). The account of inflection proposed here predicts that children will either drop inflectional endings completely or avoid bare stems. A parameterized account of this sort precludes a situation in which the child systematically uses both a 0 affix and lexical affixes.

There are a couple of possible explanations for this state of affairs, both of which were suggested to me by H. Clahsen. First, Clahsen notes that there is some individual variation with regard to the use of 0 and -n; some children prefer the former and others the latter verb form. It is thus possible that individual children choose different values along the Stem Parameter. Those that set the parameter at [–bare stem] use -n, while those that set the parameter at [+bare stem] tend to use zero affixation. While there is nothing in the Stem Parameter analysis which precludes individual variation of this sort, it is difficult to imagine, given the degree to which the language is

longer to set the parameter than the other children discussed thus far. Unfortunately, I have no satisfactory answer to this question.

[8] It is not entirely clear why mastery of the agreement system with non-present referents (age 5-6) is so much later than with present referents (age 3 1/2). At first glance it would seem that the difficulty lies in the child having to associate a referent with an arbitrary abstract point in space (as opposed to a physically present object or individual). While the abstractness does appear to be a contributing factor, Lillo-Martin (1986) found that by age four children were able, in comprehension at least, to associate nominals with points in space. Since acquisition of agreement with non-present referents may involve factors which are not strictly linguistic in nature, we may assume for the purposes of this discussion that ASL speaking children acquire agreement roughly around age 3 1/2.

[9] I should note that the two values of the Stem Parameter generate languages which are disjoint sets, i.e. one language in which all verbal forms are inflected and another in which none are. Thus, the Subset Principle (Berwick, 1982; Manzini & Wexler, 1987)), which requires that when a subset relation exists the child first choose the value which generates the smallest language, is not applicable.

[10] These are hypothetical examples of the phenomenon discussed in Grodzinsky, 1984. The actual Italian examples he cites involve complications which are irrelevant to the present discussion.

[11] The analysis is also supported on theory-internal grounds. In Hyams (1987) I suggest that where inflection represents a core property of the language it may show significant interaction with other aspects of core grammar; conversely, where it is peripheral we would predict its grammatical function to be minimal. The manner in which inflection interacts with the null subject phenomenon seems to bear out this expectation.

Jaeggli & Safir (1987) offer an analysis of the Null Subject Parameter which is based in part on the Stem Parameter idea. Specifically, they propose that null subjects are licensed in languages which on my analysis reflect the Stem Parameter in one or the other of its unmarked states, + or – bare stem (e.g. Italian, Chinese). Null subjects are not permitted in "mixed" languages, that is, languages which, I suggest, have peripheral inflection, English for example. The central idea is that the Stem Parameter (or alternatively

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[12] As a case in point, D. Slobin (personal communication) informs me that in Turkish, a highly inflected language, the verb does, on rare occasion, surface as a bare stem, for example in the simple imperative form, e.g. ver 'give'. Slobin notes further that children do not put affixes on the imperative verb, as would be predicted by the account proposed here. Rather, Turkish children make strikingly few errors of any sort in learning a complex inflectional system, while still using the (marked) imperative in its correct bare stem form.

Closer inspection of the data, however, reveals that Turkish children do not assign the inflected and bare forms precisely the same status. This is shown by the relative order of acquisition of the inflectional verbal paradigms and the bare stem imperative form. Atsu-Koc and Slobin (1985) note that "much of the verbal paradigm is mastered by 24 months of age or earlier. By this age Turkish children inflect...the verb for tense-aspect (past result, ongoing process, intention), person, negation and interrogation" (p. 845). They also report, in a discussion of the acquisition of 'politeness norms,' that "Request forms expressing degrees of politeness are acquired in a progressive sequence between the ages of 2 and 4" (p. 869), the first of these forms being the bare imperative form noted above. Thus, the bare stem imperative form appears to be acquired at age 2, a point at which the child has already mastered many of the other inflected verb forms. If this is the case, the Turkish data are in fact consistent with the analysis proposed in this paper—the later development of the imperative being due to its marked status. I should further note that

the relatively late acquisition of the imperative cannot be attributed to any semantic or conceptual difficulty with the construction since the imperative is acquired very early in many other languages.

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